CAREER AND TECHNICAL EDUCATION

9-12 PC Systems 2021

BOARD APPROVAL DATE: August 17th, 2021

BOARD ADOPTION OF STATE STANDARDS: September 1st, 2022

Unit Overview (Standards Coverage)				
Unit	**Standards**	**Unit Focus**	**Skills Overview**	**Suggested Pacing**
Unit 1	**12.9.3.IT.12** **12.9.3.IT-NET.2** **12.9.3.IT-SUP.5** **8.1.12.CS.1**	**Introduction to a Typical PC**	**Identify the major components inside a typical PC and their functions.**	**1 week**
Unit 2	**12.9.3.IT.12** **12.9.3.IT-SUP.5** **8.1.12.CS.1** **8.1.12.CS.2**	**Operating Systems**	**Understanding the operating system is essential for troubleshooting a PC system.**	**2 Weeks**
Unit 3	**12.9.3.IT-PROG.4** **12.9.3.IT-NET.5** **8.1.12.CS.3**	**Motherboards**	**Identify different types of motherboards and install motherboards into a computer case.**	**1 week**
Unit 4	**12.9.3.IT-PROG.3** **12.9.3.IT-SUP.3** **8.1.12.CS.3**	**CPU**	**Identify the type of CPU and the process of installing and or upgrading the CPU can range from easy to nearly impossible.**	**1 Week**
Unit 5	**12.9.3.IT.6** **12.9.3.IT.9** **12.9.3.IT-SUP.4** **8.1.12.CS.3**	**Power Supplies**	**Identify, install a power supply into the computer case, and connect power to all components requiring power.**	**1 week**
Unit 6	**12.9.3.IT.12** **12.9.3.IT-SUP.7** **8.1.12.CS.3**	**Memory**	**Identify the different types of memory and install the correct amount of memory into the computer.**	**1 week**
Unit 7	**12.9.3.IT.13** **12.9.3.IT-NET.3** **8.1.12.CS.3**	**Input Devices**	**Connect varies types of input devices to the**	**1 week**

			computer and understand their individual functions.	
Unit 8	**12.9.3.IT-SUP.1** **12.9.3.IT.2** **8.1.12.CS.3**	**Video Display and Audio Systems**	**Change varies display and sound devices** **connected to a computer. Load and install drivers for video and sound devices.**	**2 weeks**
Unit 9	**12.9.3.IT-PROG.1** **12.9.3.IT-SUP.5** **8.1.12.CS.3** **8.1.12.DA.4**	**Magnetic Storage Devices**	**Identify varies types of storage devices and** **install into a computer systems.**	**2 weeks**
Unit 10	**12.9.3.IT.7** **12.9.3.IT-NET.2** **8.1.12.CS.3**	**CD Technology**	**An overview of the development of CD technology – types – storage –** **methods of recording information onto the disk.**	**1 week**
Unit 11	**12.9.3.IT-PROG.9** **12.9.3.IT-SUP.3** **8.1.12.CS.3**	**Printers**	**The basic operation of most types of printers – laser and ink jet, and** **how to install printers to computers/networks.**	**2 weeks**
Unit 12	**12.9.3.IT-SUP.7** **12.9.3.IT-NET.2** **8.1.12.CS.3**	**Portable PCs**	**An overview of types of computers with rechargeable batteries –** **laptops – notebooks – smartphones.**	**2 weeks**
Unit 13	**12.9.3.IT.1** **12.9.3.IT.9** **8.1.12.CS.3**	**Modems and Transceivers**	**A review of the many forms of modems used by all devices connected** **to the Internet.**	**2 weeks**

Unit 14	**12.9.3.IT-PROG.2** **12.9.3.IT-SUP.5** **CRP10** **8.1.12.CS.3**	**Viruses**	**The fundamentals of virus infection, protection, and its elimination in the computer environment.**	**1 week**
Unit 15	**12.9.3.IT-PROG.5** **12.9.3.IT-PROG.7** **12.9.3.IT.12** **8.1.12.CS.3**	**PC Troubleshooting**	**PC troubleshooting involves making decisions based on type of failures in the hardware or software. Determining the problem will lead into a series of procedures to resolve the issues in a timely manner.**	**3 weeks**
Unit 16	**12.9.3.IT-PROG.3** **12.9.3.IT-PROG.4** **8.1.12.CS.3** **8.1.12.NI.1**	**Introduction to Networking**	**A basic understanding of the principals and operation of networked computers.**	**2 weeks**
Unit 17	**12.9.3.IT-PROG.9** **12.9.3.IT-PROG.7** **8.1.12.CS.3** **8.1.12.NI.1**	**Network Administration**	**The use of network software packages to manage network system operations, network security and coordination of shared resources.**	**2 weeks**
Unit 18	**12.9.3.IT-PROG.9** **12.9.3.IT-PROG.7** **8.1.12.CS.3** **8.1.12.NI.1**	**WAN - Wide Area Networks**	**A basic understanding of how a WAN operates and to explain some of the technical terminology associated with wide area networks.**	**1 weeks**
Unit 19	**12.9.3.IT-PROG.9** **12.9.3.IT-PROG.7** **8.1.12.CS.3**	**Small-Office/Home-Office (SOHO) Networking**	**Learn how to use the Network Setup Wizard to configure a SOHO network and how to troubleshoot the common**	**1 week**

			problems that can occur in a SOHO network.	
Unit 20	12.9.3.IT-PROG.9 12.9.3.IT-PROG.7 8.1.12.IC.1	Customer Support, Communication, and Professionalism	The basic skills necessary to function in a customer or client-related environment.	1 week
Unit 21	12.9.3.IT-PROG.9 12.9.3.IT-SUP.2 8.1.12.IC.1	CompTIA A+ Certification Exams Preparation	A preparation study guide leading towards taking a certification test. A review of questions that can be asked on most certification exams.	1 week
Unit 22	12.9.3.IT-SUP.9 12.9.3.IT-PROG.4 8.1.12.IC.1	Employment and Advanced Education	A review of methods to gain employment and ways to advance your career as a computer service and repair.	1 week
Unit 23	9.3.ST.5 9.3.ST-SM.1	Robotics	Overview of Robotic Technology	1 week
Unit 24	9.3.ST-ET.1 9.3.ST-ET.4	Lego EV3 Robotic Programming	EV3 Programming	2-3 weeks
Unit 25	9.3.ST.5 9.3.ST-SM.2	3D Design	Overview of 3D Design	1 week
Unit 26	9.3.ST-ET.1	3D Design Software	Design in 3D	2-3 weeks
Unit 27	9.3.ST-ET.3 9.3.ST-SM.1	3D Printing	Overview of 3D Printers/Printing	2-3 weeks
Unit 28	9.3.ST.5 9.3.ST-ET.6	Virtual Reality	Overview of VR Technology	1 week
Unit 29	9.3.ST-ET.1 9.3.ST-ET.4	VR Design	Design/Programming in VR	2-3 weeks

This document outlines in detail the answers to following four questions:

-Curricular Framework – CTE 9-12 / PC Systems

1. **What do we want our students to know?**
2. **How do we know if they learned it?**
3. **What do we do if they did not learn it?**
4. **What do we do when they did learn it?**

Unit 1 - Introduction to a Typical PC CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems. • 12.9.3.IT-PROG.1 Analyze customer software needs and requirements.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to maintain service.** • **12.9.3.IT-SUP.2 Manage operating systems and**	**statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships between internal and external computer components.**	

software applications, including maintenance of upgrades, patches and service packs. ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem Solving and Decision Making** ● **NJCCS 9.3.12.3 Follow Multi-step Procedure**	● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.** **8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.**	

• **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	

Unit 1 - Introduction to a Typical PC

Stage 1 – Desired Results

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a PC Computer.** **What are the major components of a PC Computer.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.**

What are the four functions of a computer.	**Internet Resource Links:** **www.cbi.umn.edu** **www.computerhistory.org** **www.intel.com** **www.karbosguide.com** **www.pcguide.com**

UNDERSTANDINGS
Students will understand that… **Students will learn to identify the major components inside a typical PC and their functions.**

Students will know…	**Students will be able to…**
What content will be covered that students must master? **Students will learn to install and maintain computer hardware and software systems.** **They will learn to diagnose and repair components and functions and learn how to solve failures when they occur. Students will have an opportunity to practice these skills in a series of hands-on lab activities.** **· An impossible problem can be made possible by applying what you know.** **· The process of elimination is crucial in diagnosing and repair of a PC.** **· Self Discipline to read and write is crucial for success.** **· Working in teams helps to diagnose and problem solve.**	*What should students be able to accomplish to demonstrate understanding?* **Explain the role of computers** **Explain what a computer is.** **Describe computer data.** **Identify the major components of a typical PC.** **Describe the power-on sequence of a typical PC.** **Explain how the major components interact with each other.** **Interpret the common prefixes associated with the computer's size and speed.** **Define electrostatic discharge.** **Identify common tools used to service a PC.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Group / Team Projects **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify major motherboard components.

Identify common motherboard ports.

Identify components of the four functions of a computer.

Identify common computer tools.

Open computer and remove components.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* *•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 2 -Operating Systems CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems. • 12.9.3.IT-PROG.1 Analyze customer software needs and requirements.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to maintain service.** • **12.9.3.IT-SUP.2 Manage operating systems and**	**statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships between internal and external computer components.**	

software applications, including maintenance of upgrades, patches and service packs. ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem Solving and Decision Making** ● **NJCCS 9.3.12.3 Follow Multi-step Procedure**	● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.** **8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.**	

• **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	

Unit 2 -Operating Systems
CTE - 9-12 / PC Systems

Stage 1 – Desired Results

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is an operating system.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)**

What is GUI OS Environment **What is CUI OD Environment.**	**Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.ami.com** **www.dell.com** **www.global.acer.com** **www.ibm.com** **www.microsoft.com**
UNDERSTANDINGS	
Students will understand that… **Students will learn that understanding the operating system is essential for troubleshooting a PC system.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **An operating system is the most important software that runs on a computer. It** **manages the computer's memory, processes, and all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is useless.** **Your computer's operating system (OS) manages all of the software and hardware on the computer. Most of the time, there are many different computer programs** **running at the same time, and they all need to access your computer's central processing unit (CPU), memory, and storage. The operating system coordinates all of this to make sure each program gets what it needs.**	*What should students be able to accomplish to demonstrate understanding?* **Identify various computer operating systems.** **Explain minimum requirements of an operating system.** **Describe the three core DOS files.** **Identify DOS limitations.** **Explain the differences between the various versions of the Windows operating system.** **Describe the boot process.** **Describe the relationship of applications software; operating systems, BIOS, and system hardware components.** **Describe the common characteristics of different operating systems.**
Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Lab Reports **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify a GUI OS.

Identify a CUI OS.

Identify hardware components of a GUI and CUI OS.

Modify the BIOS of the OS.

Install the OS.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes...
Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 3 -Motherboards CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
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• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 3 -Motherboards **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	**CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)**
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What factors will you consider when selecting a motherboard.** **How can you add peripheral devices to a system?** **What factors should you consider when adding an expansion card to a computer?**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.asus.com** **www.amd.com** **www.formfactors.org** **www.giga-byte.com** **www.intel.com** **www.micron.com** **www.motherboards.org** **www.sis.com** **www.soyo.com** **www.via.com** **www.hp.com**

UNDERSTANDINGS
Students will understand that… **Students will be able identify different types of motherboards and install motherboards into a computer case.**

Students will know…	**Students will be able to…**
What content will be covered that students must master? **Students will identify the fundamental principles of a motherboard and the installation, configuration, optimization, and types of peripheral devices.** **Students will also identify the tools, installation procedures, and troubleshooting** **techniques for motherboards.**	*What should students be able to accomplish to demonstrate understanding?* **Identify major parts of a motherboard.** **Identify common motherboard form factors.** **Explain motherboard bus architecture.** **Identify expansion slot architectures.** **Identify the important system resources and explain what they are used for.** **Identify and explain IRQs.** **Explain the role of a chipset.** **Explain the purpose of the CMOS Setup program.** **Explain the procedure for upgrading a Flash BIOS.**

Stage 2 – Assessment Evidence	
Performance Tasks:	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?*

What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)? *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• *Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)*

• *Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.*

• *Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.*

•*Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.*

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify the major types of motherboards, and expansion cards available.

Identify common motherboard form factor types.

Install a motherboard into the computer case.

Install peripheral devices into the motherboard.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 4 -CPU CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 4 -CPU **CTE - 9-12 / PC System**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How is CPU performance measured?** **Which CPU fits which socket?** **What is the difference between 32-bit and 64-bit processing?** **What is the purpose of thermal compound.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.intel.com** **www.amd.com** **www.ibm.com** **www.motorola.com** **www.sun.com**

UNDERSTANDINGS	
Students will understand that… **Students will learn to identify the type of CPU and the process of installing and or upgrading the CPU can range from easy to nearly impossible.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Students will learn to identify / install the correct CPU onto the correct motherboard with the correct heatsink / fan components.**	*What should students be able to accomplish to demonstrate understanding?* **Identify the operation, function, and purpose of the CPU.** **Differentiate between the internal and external bus system** **Identify and explain the major portions of a CPU.** **Briefly review the evolution of the CPU.** **Identify sockets and SEC connections associated with the CPU.** **Identify and explain the purpose od a voltage regulator.** **Explain real and protected modes of operation.** **Define the terms multiple branch prediction, superscalar technology, processor affinity, processor throttling, and MMX technology as it applies to the CPU.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Current Events **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify differnet types of CPU sockets with actual CPUs.

Install the CPU onto a motherboard socket.

Apply the correct amount of thermal compound between the CPU and heatsink.

Attach the heatsink fan assemble and plug in the fans power to the motherboard.

Check CPU speed in the BIOS.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 5 -Power Supplies CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 5 -Power Supplies **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How does a power supply convert AC to DC power.** **What does watts mean on a power supply.** **Do all power cables on the power supply have to be connected into the computer.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools**. Internet Resource Links: www.corsair.com www.antec.com www.apcc.com www.bestpower.com www.duracell.com www.tomshardware.com/faq/id-1927916/power-supply-101-understanding-power-supplies-selecting-job.html

UNDERSTANDINGS	
Students will understand that… **Students will be able to identify, install a power supply into the computer case, and connect power to all components requiring power.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Power supplies are the primary supplier of power to your motherboard.** **They do this by converting the high voltage alternating current (AC) that comes out of the wall socket (in the range of 110V to 240V) into usable low voltage direct current (DC).** **Determine the correct power supply choice for a new computer.**	*What should students be able to accomplish to demonstrate understanding?* **Replace a PC power supply unit.** **Determine if a power supply is defective.** **Check the voltage input and output of a power supply unit.** **Install the power supply into the case and connect the power to the motherboard.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Quizzes / Tests **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify the power supply information label.

Install the power supply into the computer.

Connect power cables to the computer components.

Determine if the power supply is functional with a diagnostic tool.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 6 -Memory CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 6 -Memory **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What type of memory does your personnel computer have.** **What is the difference between PC Memory and Laptop Memory.** **What is the limit of memory storage for a 32 bit OS PC.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.intel.com** **www.corsair.com** **www.kingston.com** **www.fujitsu.com**

UNDERSTANDINGS	
Students will understand that… **Students will be able identify the different types of memory and install the correct amount of memory into the computer.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Memory is the Random Access memory that a computer uses when it is in operation.** **It is the volatile memory and it means that when the power is switched off, the data is vanished from it. Memory can have many of the types. Each type is better than the previous one, but specific to the requirements of the motherboard.**	*What should students be able to accomplish to demonstrate understanding?* **Identify the amount of Memory installed in the PC.** **Identify the amount of virtual memory.** **Access the Resource Monitor utility.** **Visually identify the different types of memory.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

On-line Google Instructions / Demonstrations **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify typical memory problems.

Identify and classify the various types of memory available.

Install all types of memory into the correct memory slots on the motherboards.

Determine the amount of memory and add more memory to a PC.

Test memory with diagnostic tools.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* *•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 7 -Input Devices CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 7 -Input Devices **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is the difference between a PS2 input and USB input connection.** **Why do computers require input.** **Why do some input devices require software drivers to be installed first.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.blackbox.com** **www.irda.org** **www.logitech.com** **www.microsoft.com** **www.usb.org** **www.wi-fi.org**

UNDERSTANDINGS
Students will understand that… **Students will be able to connect various types of input devices to the computer and understand their individual functions.**

Students will know…	Students will be able to…
What content will be covered that students must master? **The student will be able to understand that: Input devices enable you to input data and commands into the computer via various types of input devices.**	*What should students be able to accomplish to demonstrate understanding?* **Explain how a keyboard scan code is generated.** **Modify input device properties of a keyboard or mouse using Control Panel.** **Explain how to access input device information using Device Manager.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

On-line Google Instructions / Demonstrations **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Identify all major input devices that can be connected to the computer.

Connect all varies types of input devices to the computer.

Connect input devices after the PC has been turned on.

Test and repair input devices with component testers.

Replace broken components of input devices.

Do Not Throw Keyboards and steal mouse balls.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 8 -Video Display and Audio Systems CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 8 -Video Display and Audio Systems **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How does an image appear on the display device.** **How is audio sound produce.** **What is the difference between vga, dvi and hdmi connections.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools**. **Internet Resource Links:** **www.nvidia.com** **www.microsoft.com** **www.sony.com** **www.soundblaster.com** **www.yamaha.com**

UNDERSTANDINGS
Students will understand that… **Students will be able to change various display and sound devices connected to a computer. Students will be able to load and install drivers for video and sound devices.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to install / setup various types of display and sound devices.**	*What should students be able to accomplish to demonstrate understanding?* **Describe the basic operation of the CRT.** **Describe the basic operation of the LCD – LED panel.** **Explain screen resolution.** **Define screen pitch.** **Explain the major steps for installing a video adapter card.** **Explain the major steps of installing a sound card.** **Define different display systems.** **Explain how data compression works.** **Explain how MIDI produces sound.** **Compare WAV file and MIDI file types.** **Explain how sampling rate and number of bits determine the quality of analog-to-digital conversion.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance? **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Modify the appearance of the desktop area.

Change the screen saver.

Change the resolution of the screen.

Install video and sound drivers to level three.

Resolve missing drivers via device manager.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 9 -Magnetic Storage Devices CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 9 -Magnetic Storage Devices **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is the difference between an IDE and SATA storage device.** **What must be done to prepare a storage device for data.** **What type of software is used with storage devices.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.adaptec.com** **www.ibm.com** **www.maxtor.com** **www.quantum.com** **www.scsita.org** **www.westerndigital.com** **www.seagate.com**

UNDERSTANDINGS
Students will understand that… **Students will be able to identify various types of storage devices and install into a computer systems.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to configure multiple storage devices and install devices into computer systems.** **Students will be able test storage devices using various testing devices.**	*What should students be able to accomplish to demonstrate understanding?* **Explain how magnetic principles are used for data storage.** **Understand disk geometry.** **Explain how disk fragmentation occurs.** **Explain the purpose of using ScanDisk and Chkdsk.** **Identify major parts of common disk storage units.** **Select the appropriate file storage system.** **Explain how to install a second hard drive.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Current Events **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Prepare a storage device for data.

Install a storage device into the computer.

Connect the storage device into the motherboard.

Add a second and or third storage device to the computer.

Replace bad storage device.

Test storage device with testing equipment.

Change storage device jumper settings.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

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Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

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Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

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Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

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Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

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Unit 10 -CD Technology CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
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Unit 10 -CD Technology **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is an optical drive.** **What type of lasser does an optical drive use, is there more than one.** **How much data can be stored on a optical drive.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.hp.com** **www.iomega.com** **www.phillips.com** **www.sony.com** **www.verbatim.com**

UNDERSTANDINGS
Students will understand that… **An overview of the development of CD technology – types – storage – methods of recording information onto the disk.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will learn how information is recorded onto the optical disk.** **Students will understand the difference between various types of CD storage methods.**	*What should students be able to accomplish to demonstrate understanding?* **Explain how data is stored and retrieved using optical storage devices.** **Describe how CD and DVD discs are constructed.** **Explain different CD formats such as CD-ROM, CD-R, CD-RW, and DVD-RW.** **Describe major parts of a CD and DVD storage device.** **Define Sierra format.** **Explain the steps for installing an optical drive.** **Discuss the compatibility of different CD and DVD formats.** **Explain the CD file systems ISO 9660 and UDF.** **Distinguish between CD, DVD, HD-DVD, and Blu-ray Disc Storage technologies.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Current Events **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Install an optical drive into a computer.

Install the software for an optical drive.

Take apart an old optical drive.

Record data onto an optical drive using the OS program.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes...
Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 11 -Printers CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 11 -Printers **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How does the ink/toner stick to the paper.** **What type of printer drivers are needed between usb and tcp/ip type printers.** **Why would a printer print out gibberish.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.epson.com** **www.hp.com** **www.ricoh.com** **www.xerox.com**

UNDERSTANDINGS
Students will understand that… **The basic operation of most types of printers – laser and ink jet, and how to install printers to computers/networks.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will understand the methods of produce text/images onto paper with a printer.** **Students will be able to install a printer to a computer / network.** **Students will be able to troubleshoot basic printer problems.**	*What should students be able to accomplish to demonstrate understanding?* **Expalin the operating principles of a laser printer.** **Explain the operating principles of an inkjet printer.** **Explain the operating principles of a dot matrix printer.** **Explain how to install a printer.** **Install print driver software.** **Complete printer installation and setup.** **Identify and diagnose common laser printer faults.** **Explain how fonts are generated and installed.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Lab Reports **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Install and setup a local printer to a computer.

Download the printer drivers from the Internet.

Take apart an old printer.

Add a printer to a network.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 12 - Portable PCs CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 12 - Portable PCs **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **Can a laptop be more powerful than a desktop computer.** **Are portable devices more likey to be damage.** **How much data storage is available on an average portable device.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.3com.com** **www.bluetooth.com** **www.comdex.com** **www.compaq.com** **www.hp.com** **www.ibm.com** **www.motorola.com** **www.palm.com** **www.sun.com**

UNDERSTANDINGS
Students will understand that… **An overview of types of computers with rechargeable batteries – laptops – notebooks – smartphones.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will understand the difference between a laptop vs a desktop.** **Students will learn how batteries can power portable devices.** **Students will understand the different methods of receiving/sending data to portable devices.**	*What should students be able to accomplish to demonstrate understanding?* **Distinguish between laptops, notebooks, palmtops, and personal digital assistants.** **Identify the parts that are different in full-size PCs and portable PCs.** **Explain the difference the types of batteries used in portable PCs.** **Identify the three standard PCMCIA cards.** **Identify the two widths of ExpressCards.** **Define what the Bluetooth standard does.** **Describe how Windows Briefcase is used.** **Describe direct cable connection communications.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance?	**Formative / Summative Assessments**
Laboratory Projects **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Transfer files from a portable device to a desktop.

Setup portable devices for use by multiple users.

Install varies OS on portable devices.

Track the amount of charge available on several portable devices.

Upgrade devices with new hardware – if possible.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 13 -Modems and Transceivers CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Unit 13 -Modems and Transceivers **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a modem.** **What type of signal does a modem have to use.** **How fast can a modem transmit data.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools**. **Internet Resource Links:** **www.56k.com** **www.cablelabs.com** **www.catv.org** **www.teledata-networks.com** **www.usrobotics.com** **www.verizon.com** **www.comcast.com**

UNDERSTANDINGS
Students will understand that… **A review of the many forms of modems used by all devices connected to the Internet.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to identify the different types of modems used in today's Internet.** **Students will be able install/setup a modem connection between a computer and the Internet.** **Students will understand how data is transmitted through a modem.**	*What should students be able to accomplish to demonstrate understanding?* **Identify base features of telephone wiring systems.** **Explain the operation of a modem.** **Explain how modems negotiate a connection.** **Set up a standard modem.** **Use the Phone and Modem Optios dialog box.** **Explain ISDN, DSI, Cable, and T-carrier lines.** **Identify several basic AT commands.** **Diagnose common modem problems.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Lecture / Notes **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Connect a computer to a phone modem.

Connect a computer to a DSL modem.

Compare two computers with two different modems, are the speeds the same.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 14 -Viruses CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 14 -Viruses **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a virus.** **How do you identify a virus in a computer.** **What type of virus protection software is the best.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.antivirus.com** **www.cert.org** **www.datafellows.com** **www.datarescue.com** **www.fedcirc.gov** **www.f-secure.com** **www.lavasoft.com** **www.mcafree.com** **www.norman.com** **www.ontrack.com** **www.stiller.com** **www.symantec.com** **www.virusbtn.com**

UNDERSTANDINGS
Students will understand that… **The fundamentals of virus infection, protection, and its elimination in the computer environment.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to identify various forms of virus.** **Students will be able to take steps of protection from virus.** **Students will be able to install various forms of virus protection programs.**	*What should students be able to accomplish to demonstrate understanding?* **Identify common virus characteristics.com** **Explain how virus detection.** **Explain how virus are spread.** **Explain the prevention of virus infection.** **Define virus signature.** **Classify viruses by their action or description.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance? **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Review and identify all forms of virus.

Review and install virus protection programs.

Remove infected computer virus with help from virus programs.

Review OS downloads – what files deal with virus.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 15 -PC Troubleshooting CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 15 -PC Troubleshooting **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How do you determine the computer problem issues?** **What type of diagnosis tools are necessary for a repair technician.** **How often does a computer need to be clean and or serviced?**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** Internet Resource Links: www.biocentral.com www.support.dell.com www.support.microsoft.com www.ami.com www.computerhope.com www.configsafe.com www.pc-doctor.com www.phoenix.com www.sysinternals.com www.winternals.com

UNDERSTANDINGS
Students will understand that… **PC troubleshooting involves making decisions based on type of failures in the hardware or software. Determining the problem will lead into a series of procedures to resolve the issues in a timely manner.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to determine pc problems as a hardware or software issue.** **Students will be able resolve hardware failures.** **Students will be able to resolve software failures.** **Students will understand how to use system diagnosis tools.**	*What should students be able to accomplish to demonstrate understanding?* **State commonly practiced troubleshooting steps.** **Identify the three stages of computer operation.** **Recognize common startup problems and understand their causes.** **Restart a PC in a variety of troubleshooting modes.** **Identify the appropriate diagnostics utility to use given a specific problem.** **Step through a PC's boot sequence.** **Explain basic data recovery methods.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance? **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Replace faulty hardware components.

Resolve faulty software program issues.

Maintain computer systems with service checks.

Use advanced diagnosis tools to determine pc problems.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 16 - Introduction to Networking CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 16 - Introduction to Networking **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a network of computers.** **What type of tools are used in a network.** **How do computers communicate in a network.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.blackbox.com** **www.cables-unlimited.com** **www.howstuffworks.com** **www.techfest.com**

UNDERSTANDINGS
Students will understand that… **A basic understanding of the principals and operation of networked computers.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will understand the basic principles of computers in a network.** **Students will be able to join several computers into a basic network.** **Students will be able to use tools related to networking.**	*What should students be able to accomplish to demonstrate understanding?* **Identify and describe network topologies.** **Describe the communication theory of a network system.** **List and describe common network systems.** **Describe the communication principles of Ethernet and Token Ring systems.** **Describe the installation of a typical network adapter.** **Identify common network cabling materials.** **Identify a network's basic hardware devices.** **List and describe the layers of the OSI model.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Lab Reports **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Construct a small peer to peer network.

Create custom length standard Cat5e network cables.

Use networking tools.

Create a shared network drive for the peer network.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s:
Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

SPED:
Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 17 - Network Administration CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 17 - Network Administration **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a network administrator.** **What type of software does an network administrator use in the network.** **What is a domain, group and user for the network administrator.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.dell.com** **www.ibm.com** **www.microsoft.com** **www.novell.com** **www.linux.com**

UNDERSTANDINGS
Students will understand that… **The use of network software packages to manage network system operations, network security and coordination of shared resources.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to install and use network software.** **Students will be able to determine problems are either PC based or in the network.** **Students understand the responsibilities of a Network Administrator.**	*What should students be able to accomplish to demonstrate understanding?* **Explain the difference between user-level and share-level security.** **Explain the role of the network administrator.** **Describe the characteristics of centralized and decentralized network administration.** **Describe the characteristics of a strong password.** **Describe some of the features that may be implemented to increase network security.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Skill Presentations **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Create a client / server network.

Install Windows 2003 Advanced Server software.

Add user accounts to a network.

Set user login rights to groups of users.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* *•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 18 -WAN - Wide Area Networks CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 18 -WAN - Wide Area Networks **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a WAN Network.** **How does data travel through the Internet.** **What is a router – why is important in the WAN network.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.cisco.com** **www.domainregistry.com** **www.learntcpip.com/OSIModel/OSIModel.html** **www.linux.com** **www.microsoft.com** **www.novell.com** **www.pacbell.com** **www.unix.com** **www.youdzone.com**

UNDERSTANDINGS
Students will understand that… **A basic understanding of how a WAN operates and to explain some of the technical terminology associated with wide area networks.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will understand how WAN operate on the Internet.** **Students will understand how data travels through the WAN.** **Students will have the basic history of the creation of today Internet.**	*What should students be able to accomplish to demonstrate understanding?* **Explain the difference between a LAN and a WAN.** **Explain how IP addresses are used.** **Explain DNS, WINS, and DHCP services.** **Explain the use of common diagnostic utilities associated with networks.** **Describe the physical structure and evolution of the Internet.** **Identify equipment associated with a WAN.** **Describe the function of several common network troubleshooting software commands.** **Explain how to set up an e-mail account.** **Describe the common features associated with e-mail.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance? **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Setup up a network with a router.

Review the procedures for joining an ISP.

Setup a computer to be remotely controlled through the WAN Network.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.

Tier I:
Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.

Tier II:
Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.

Tier III:
Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.

ELL:
Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.

504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 19 -Small-Office/Home-Office (SOHO) Networking CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 19 -Small-Office/Home-Office (SOHO) Networking **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a SOHO.** **What type of network media is used in a SOHO.** **How do you configure a SOHO network with Windows OS.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.microsoft.com** **www.2wire.com** **www.3com.com**

UNDERSTANDINGS
Students will understand that… **Learn how to use the Network Setup Wizard to configure a SOHO network and how to troubleshoot the common problems that can occur in a SOHO network.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will learn to use the type of media that will be used to connect the PCs together.** **Students will determine the manner in which the networked PCs will access the Internet.** **Students will determine the level of administration that wil be used to protect the network from intruders.** **Students will select the method of security for the network.**	*What should students be able to accomplish to demonstrate understanding?* **Determine the best media for use in a SOHO network based on cost and building structure.** **Determine an appropriate Internet access configuration based on the number of PCs and the type of network media used in a SOHO network.** **Design a SOHO network based on the media, the number of PCs, and the type of Internet access that will be used.** **Determine an appropriate level of administration for a SOHO network.** **Identify methods to secure a SOHO network.** **Use the Network Setup Wizard to set up Internet Connection Sharing (ICS) on a host PC.** **Use the Network Setup Wizard to allow a client access to the Internet through a host PC.** **Explain the networking features in Windows OS.** **Explain how Network Discovery works in Windows OS.** **Identify common problems that can occur in a new SOHO network installation.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?*	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities**

How will students demonstrate their understanding (meaning-making and transfer) through complex performance? **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	**On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Design a SOHO network for a home network.

Configure a VPN on a peer network.

Configure a firewall on the peer network.

Configure multiple printers on the peer network.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

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Unit 20 -Customer Support, Communication, and Professionalism CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 20 -Customer Support, Communication, and Professionalism **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	**CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)**
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is the help desk.** **What level of help does a call center provide.** **Listening skills, an important customer support feature.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.oneorzero.com** **www.technet.microsoft.com** **www.helpstar.com** **www.troubleticketexpress.com**

UNDERSTANDINGS
Students will understand that… **The basic skills necessary to function in a customer or client-related environment.**

Students will know…	**Students will be able to…**
What content will be covered that students must master? **Students will understand how to deliver customer support.** **Students will learn of the multiple levels of support within most organizations.** **Students will learn the skills of customer communication.**	*What should students be able to accomplish to demonstrate understanding?* **Explain the difference between a help desk and a call center.** **Describe the three levels of technical support.** **Identify desirable communications skills.** **Explain how body language influences customer and client perceptions.** **Identify the traits that exhibit a professional image.** **Identify strategies for dealing with difficult customers and clients.** **Explain the importance of performing a follow-up in customer relations.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Skill Presentations **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Create a document that provides in class support of current projects.

Create a video tutorial of a service procedure.

Maintain a database of support documents for future use.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* *•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 21 -CompTIA A+ Certification Exams Preparation CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 21 -CompTIA A+ Certification Exams Preparation **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is the CompTIA A+ Exam.** **What is the NOCTI Exam.** **What is required study material for a certification exam.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **www.comptia.org**

UNDERSTANDINGS
Students will understand that… **A preparation study guide leading towards taking a certification test. A review of questions that can be asked on most certification exams.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will prepare to take a certification exam.** **Students will understand the types of certification exams available and what is required to pass the exams.** **Students will take practice exams for certification and determine areas of further study required.**	*What should students be able to accomplish to demonstrate understanding?* **Explain the format of the CompTIA A+ Certification exams.** **Explain eligibility for taking the CompTIA A+ Certification exams.** **Identify strategies for preparing for the CompTIA A+ Certification exams.** **Evaluate your readiness for the CompTIA A+ Certification exams.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan
• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.) *• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.* *• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.* *•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.* ***What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?*** ***Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?*** ***Does the learning plan reflect principles of learning and best practices?*** ***Is there tight alignment with Stages 1 and 2?*** ***Is the plan likely to be engaging and effective for all students?*** ***PROGRESS MONITORING*** ***How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?*** ***What are potential rough spots and student misunderstandings?*** ***How will students get the feedback they need?*** ***What supports are needed for students to be successful? Re-teach, small group instruction, etc.*** **LEARNING PLAN – Activities** **Form a study group of students and ask typical questions that may be on the** **certification exam.** **Take practice certification exams.** **Create your own study guide for review.** **Be aware and practice safe working skills.**
Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* •*Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 22 -Employment and Advanced Education CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 22 -Employment and Advanced Education **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What type of jobs are available with a basic certification.** **What type of certifications are employers looking for.** **What type of jobs require further training.**	**Computer Service and Repair (2008)** **Laboratory Manual Computer Service and Repair (2008)** **Study Guide Computer Service and Repair (2008)** **Classroom Computers, Related Equipment, Software, and Tools.** **Internet Resource Links:** **???** **Unknown at this time** **Department of labor (USA) and (New Jersey)**

UNDERSTANDINGS
Students will understand that… **A review of methods to gain employment and ways to advance your career as a computer service and repair.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will learn to create an action plan for employment.** **Students will learn how to keep up with the rapid changes in technology.** **Students will define their career goals.**	*What should students be able to accomplish to demonstrate understanding?* **Conduct a job search.** **Identify appropriate interview skills.** **Discuss a variety of computer careers and the associated educational requirements.** **Define entrepreneur and entrepreneurship.** **Identify career information sources.** **Identify advanced training options.** **List the elements of a successful resume.** **Outline ideas for a successful job search.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Group / Team Projects **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Conduct a search for entry level job positions.

Create a job resume.

Define your professional goals.

Create a list of references for a job interview.

Be aware and practice safe working skills.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.* *•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 23 - Robotics CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• 12.9.3.IT-PROG.1 Analyze customer software needs and requirements. • 12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications. • 12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency. • 12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications. • 12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application. • 12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language. • 12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products. • 12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle. • 12.9.3.IT-PROG.9 Perform software maintenance and customer support functions. • 12.9.3.IT-PROG.10 Design, create and maintain a database. • 12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements. • 12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security). • 12.9.3.IT-NET.3 Design a network system using technologies, tools and standards. • 12.9.3.IT-NET.4 Perform network system installation and configuration. • 12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system. • 12.9.3.IT-SUP.1 Provide technology support to	social media or in an online community. • NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources. • NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making • NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs. • NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste. • NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function. • NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants. • NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions. • NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function. • NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system. • NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world. • NJCCS 8.2.12.E.2 Analyze the relationships	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 23 - Robotics **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a lego mindstorm robot.** **How do you identify the various components of the lego mindstorm robotic kit.** **How do you connect the lego mindstorm robot to the computer for programs and system resets.**	**Small Unit of Study for Robotics (Independent)** **Internet Resources** **www.lego.com**

UNDERSTANDINGS
Students will understand that… **Will be able to assemble various lego mindstorm robotic - design based on the project requirements.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Students will be able to identify the components of the lego mindstorm robotic kit.** **Students will be able to assemble lego mindstorm robotics for project requirements.** **Students will be able to connect lego mindstorm to the computer for program downloads and reset lego brick computers.**	*What should students be able to accomplish to demonstrate understanding?* **Students will assemble lego mindstorm for project requirements.** **Students will download and reset the system for the lego mindstorm.** **Students will be to break down robots and return components to the proper storage container.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan
• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.) *• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.* *• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.* *•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.* ***What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?*** ***Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?*** ***Does the learning plan reflect principles of learning and best practices?*** ***Is there tight alignment with Stages 1 and 2?*** ***Is the plan likely to be engaging and effective for all students?*** ***PROGRESS MONITORING*** ***How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?*** ***What are potential rough spots and student misunderstandings?*** ***How will students get the feedback they need?*** ***What supports are needed for students to be successful? Re-teach, small group instruction, etc.*** **LEARNING PLAN – Activities** **Assemble robot for project requirements.** **Connect the robot to the computer for downloads and system resets.** **Breakdown robot components for proper storage.**
Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students
• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion. *• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 24 - Lego EV3 Robotic Programming CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 24 - Lego EV3 Robotic Programming **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **How do you connect the lego mindstorm robot to the computer.** **How do you create a robot program with the lego mindstorm software.** **How do you add updates (adjustments) to the program to meet the needs of the project requirements.**	**Small Unit of Study for Robotics (Independent)** **Internet Resources** **www.lego.com**

UNDERSTANDINGS	
Students will understand that… **Able to connect lego mindstorm to the computer for project requirements that the student has program with lego mindstorm software.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Students will learn to program with the lego mindstorm software.** **Students will learn to reprogram and or add updates to the robot.** **Students will learn to reset lego mindstorm to default settings.**	*What should students be able to accomplish to demonstrate understanding?* **Able to demonstrate the robot running the project with their created program.** **Able to update and or reprogram to meet project requirements.** **Able to reset lego mindstorm to default settings.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan
• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Learn the software to program the lego mindstorm robot.

Install lego mindstorm software to the assigned computers.

Connect the lego mindstorm to the computer.

Download the program from the computer to the robot.

Reset lego mindstorm to default settings.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 25 - 3D Design CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 25 - 3D Design **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	**CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)**
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is 3D Design.** **What is Tinkercad.** **How do you design an object in Tinkercad.**	**Small Unit of Study for 3D Design (Independent)** **Programs - Tinkercad and Cura** **Internet Resources** **www.tinkercad.com** **https://ultimaker.com**
UNDERSTANDINGS	
Students will understand that… **Design an object in 3D using Tinkercad based on the project requirements.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Design a 3D object in Tinkercad.** **Export design as an OBJ and or STL file.** **Open and Save 3D Design.**	*What should students be able to accomplish to demonstrate understanding?* **Students will be able to design an object using Tinkercad.** **Students will be able to open and save their 3D design in Tinkercad.** **Students will be able to export their 3D Design as a OBJ and or STL file.**
Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**
Stage 3 – Learning Plan	
• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)	

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Login to Tinkercad and set up an account.

Design a 3D object with Tinkercad and save the 3D object.

Export 3D Design as an OBJ and or STL file.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented:
Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with

students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 26 - 3D Design Software CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

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Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 26 - 3D Design Software **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is Tinkercad.** **What is a STL and OBJ file.** **What is CURA.** **How do you use Cura to print a 3D object.**	**Small Unit of Study for 3D Design (Independent)** **Programs - Tinkercad and Cura** **Internet Resources** **www.tinkercad.com** **https://ultimaker.com**

UNDERSTANDINGS
Students will understand that… **Be able to design a 3D object with Tinkercad and use CURA to properly set 3D Object to print.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Able to design a 3D object in Tinkercad.** **Able to prepare 3D objects for 3D printing with Cura program.** **Able to prepare 3D printing settings with Cura program.**	*What should students be able to accomplish to demonstrate understanding?* **Students will design a 3D object in Tinkercad.** **Students will save 3D object as a STL and or OBJ file.** **Students will be able to use Cura to prepare 3D Object for 3D Printing.** **Students will be able to prepare 3D printer with Cura software program.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan
• *Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)*

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Learn and design with the Tinkercad program.

Learn and prepare 3D objects with Cura software program.

Learn to properly set up 3D Printer settings with the Cura Software Program.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

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Unit 27 - 3D Printing CTE - 9-12 / PC Systems		
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Unit 27 - 3D Printing **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is a 3D printer.** **How do you set up the 3D printer for printing a 3D Design.** **How do you remove 3D design from the 3D printer when finished?**	**Small Unit of Study for 3D Design (Independent)** **Programs - Tinkercad and Cura** **Internet Resources** **www.tinkercad.com** **https://ultimaker.com** **Hardware:** **Ultimaker 3 + extended**

UNDERSTANDINGS
Students will understand that… **Able to take a completed 3D Design and print the object on the 3D printer.**

Students will know…	Students will be able to…
What content will be covered that students must master? **Able to set up the 3D printer for printing an 3D object.** **Able to maintain and remove 3D objects from the printer.** **Able to determine the length of time and amount of material used during the printing of the 3D object.**	*What should students be able to accomplish to demonstrate understanding?* **Students will be able to print a 3D object on the 3D printer.** **Students will be able to set up the 3D printer for printing various 3D objects.** **Students will be able to maintain and remove 3D objects when printing is finished.**

Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**

Stage 3 – Learning Plan

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Properly set up the 3D printer to print a 3D object.

Maintain and remove 3D object from the printer.

Determine the amount of material and time during 3D printing.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 28 - Virtual Reality CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 28 - Virtual Reality **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	**CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)**
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is Virtual Reality.** **What type of equipment is used in VR.** **What type of software is available to design in VR.**	**Small Unit of Study for Virtual Reality (VR) (Independent)** **Programs - Mozilla-A-Frame, Unity VR** **Internet Resources** **https://aframe.io** **https://unity.com** **Hardware:** **Oculus Rift** **HTC Vive** **Valve Index**
UNDERSTANDINGS	
Students will understand that… **Virtual Reality has many components between hardware and software design.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Able to create a simple vr software program.** **Able to set up VR equipment to host VR Computers.** **Able to determine the right hardware to purchase for VR.**	*What should students be able to accomplish to demonstrate understanding?* **Students will decide what types of VR equipment available to purchase.** **Students will be able to select the correct VR software.** **Students will be able to create a simple VR program.**
Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**
Stage 3 – Learning Plan	

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Create a simple VR program.

Set up VR equipment and run a VR program.

Choose the correct hardware for a VR project.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.

Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.

Unit 29 - VR Design CTE - 9-12 / PC Systems		
Content & Practice Standards (write in full)	**Suggested Standards for Practice**	**Critical Knowledge & Skills**
• 12.9.3.IT.1 Demonstrate effective professional communication skills and practices that enable positive customer relationships. • 12.9.3.IT.2 Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. • 12.9.3.IT.3 Demonstrate the use of cross-functional teams in achieving IT project goals. • 12.9.3.IT.4 Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. • 12.9.3.IT.5 Explain the implications of IT on business development. • 12.9.3.IT.6 Describe trends in emerging and evolving computer technologies and their influence on IT practices. • 12.9.3.IT.7 Perform standard computer backup and restore procedures to protect IT information. • 12.9.3.IT.8 Recognize and analyze potential IT security threats to develop and maintain security requirements. • 12.9.3.IT.9 Describe quality assurance practices and methods employed in producing and providing quality IT products and services. • 12.9.3.IT.10 Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. • 12.9.3.IT.12 Demonstrate knowledge of the hardware components associated with information systems. • 12.9.3.IT.13 Compare key functions and applications of software and determine maintenance strategies for computer systems.	• CCCS.MATH.CONTENT.HSN-Q.A.1-3 Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas. • CCCS.ELA-LITERACY.WHST 11-12.2. Critical Thinking, Problem Solving and Decision Making • CCCS.ELA-LITERACY.RST.11-12.4 Workplace Safety • CCCS.ELA-LITERACY.RST.11-12.4. Follow Multi-step Procedure • CCCS.ELA-LITERACY.RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. • LA.11-12.CCSS.ELA-Literacy.WHST.11-12.2e Provide a concluding statement or section that follows from and supports the information or explanation provided. • WORK.9-12.9.1.12.1 The ability to recognize a problem and apply critical thinking and problem-solving skills to solve the problem is a lifelong skill that develops over time. • WORK.9-12.9.1.12.2 Leadership abilities develop over time through participation in groups and/or teams that are engaged in challenging or competitive activities. • NJCCS 8.1.12.C.1 Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through	• Explain the role of computers • Explain what a computer is. • Describe computer data. • Identify the major components of a typical PC. • Describe the power-on sequence of a typical PC. • Explain how the major components interact with each other. • Interpret the common prefixes associated with the computer's size and speed. • Define electrostatic discharge. • Identify common tools used to service a PC.

• **12.9.3.IT-PROG.1 Analyze customer software needs and requirements.** • **12.9.3.IT-PROG.2 Demonstrate the use of industry standard strategies and project planning to meet customer specifications.** • **12.9.3.IT-PROG.3 Analyze system and software requirements to ensure maximum operating efficiency.** • **12.9.3.IT-PROG.4 Demonstrate the effective use of software development tools to develop software applications.** • **12.9.3.IT-PROG.5 Apply an appropriate software development process to design a software application.** • **12.9.3.IT-PROG.6 Program a computer application using the appropriate programming language.** • **12.9.3.IT-PROG.7 Demonstrate software testing procedures to ensure quality products.** • **12.9.3.IT-PROG.8 Perform quality assurance tasks as part of the software development cycle.** • **12.9.3.IT-PROG.9 Perform software maintenance and customer support functions.** • **12.9.3.IT-PROG.10 Design, create and maintain a database.** • **12.9.3.IT-NET.1 Analyze customer or organizational network system needs and requirements.** • **12.9.3.IT-NET.2 Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power and security).** • **12.9.3.IT-NET.3 Design a network system using technologies, tools and standards.** • **12.9.3.IT-NET.4 Perform network system installation and configuration.** • **12.9.3.IT-NET.5 Perform network administration, monitoring and support to maintain a network system.** • **12.9.3.IT-SUP.1 Provide technology support to**	**social media or in an online community.** • **NJCCS 8.1.12.E.1 Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources.** • **NJCCS 8.1.12.F Critical Thinking, Problem Solving and Decision Making** • **NJCCS 8.1.12.F.1 Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.** • **NJCCS 8.2.12.A.2 Analyze a current technology and the resources used, to identify the trade-offs in terms of availability, cost, desirability and waste.** • **NJCCS 8.2.12.A.3 Research and present information on an existing technological product that has been repurposed for a different function.** • **NJCCS 8.2.12.C.2 Analyze a product and how it has changed or might change over time to meet human needs and wants.** • **NJCCS 8.2.12.C.4 Explain and identify interdependent systems and their functions.** • **NJCCS 8.2.12.C.6 Research an existing product, reverse engineer and redesign it to improve form and function.** • **NJCCS 8.2.12.D.3 Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.** • **NJCCS 8.2.12.E.1 Demonstrate an understanding of the problem-solving capacity of computers in our world.** • **NJCCS 8.2.12.E.2 Analyze the relationships**	

maintain service. ● **12.9.3.IT-SUP.2 Manage operating systems and software applications, including maintenance of upgrades, patches and service packs.** ● **12.9.3.IT-SUP.3 Apply appropriate troubleshooting techniques in resolving computer hardware, software and configuration problems.** ● **12.9.3.IT-SUP.4 Perform installation, configuration and maintenance of operating systems.** ● **12.9.3.IT-SUP.5 Demonstrate the use of networking concepts to develop a network.** ● **12.9.3.IT-SUP.6 Evaluate the effectiveness of an information system.** ● **12.9.3.IT-SUP.7 Employ system installation and** ● **maintenance skills to setup and maintain an information system.** ● **12.9.3.IT-SUP.8 Employ system administration and control skills to monitor the performance of an information system.** ● **12.9.3.IT-SUP.9 Employ technical writing and documentation skills in support of an information system.** ● **12.9.3.IT-SUP.10 Apply quality assurance processes to maximize information system operation.** ● **NJCCS 9-12.9.1.12.B.4.c,d,e,f,g Time management; Organization; Decision Making; Goal Setting; Resources Allocation** ● **NJCCS 9-12.9.1.12.1 Collaboration and teamwork enable individuals or groups to achieve common goals with greater efficiency** ● **NJCCS 9-12.9.1.12.F.2 Demonstrate a positive work ethic in various settings, including the classroom and during structured learning experiences.** ● **NJCC.9.3.12.C Workplace Safety** ● **NJCCS 9.1.12.A Critical Thinking, Problem**	**between internal and external computer components.** ● **NJCCS 8.2.12.E.4 Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstraction, variables, data types and conditional statements).** **8.1.12.CS.1: Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.** **8.1.12.CS.2: Model interactions between application software, system software, and hardware.** **8.1.12.CS.3: Compare the functions of application software, system software, and hardware.** **8.1.12.CS.4: Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.** **8.1.12.NI.1: Evaluate the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.** **8.1.12.NI.2: Evaluate security measures to address various common security threats.** **8.1.12.NI.3: Explain how the needs of users and the sensitivity of data determine the level of security implemented.** **8.1.12.NI.4: Explain how decisions on methods to protect data are influenced by whether the data is at rest, in transit, or in use.**	

Solving and Decision Making • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.3 Follow Multi-step Procedure** • **NJCCS 9.3.12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.** • **CRP1. Act as a responsible and contributing citizen and employee.** • **CRP2. Apply appropriate academic and technical skills.** • **CRP4. Communicate clearly and effectively and with reason.** • **CRP6. Demonstrate creativity and innovation.** • **CRP7. Employ valid and reliable research strategies.** • **CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.** • **CRP9. Model integrity, ethical leadership and effective management.** • **CRP10. Plan education and career paths aligned to personal goals.** • **CRP11. Use technology to enhance productivity.** • **CRP12. Work productively in teams while using cultural global competence.**	**8.1.12.IC.1: Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.** **8.1.12.IC.2: Test and refine computational artifacts to reduce bias and equity deficits.** **8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.** **8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change.** **8.1.12.DA.2: Describe the trade-offs in how and where data is organized and stored.** **8.1.12.DA.3: Translate between decimal numbers and binary numbers.** **8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.** **8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.** **8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process.**	
Unit 29 - VR Design **CTE - 9-12 / PC Systems**		
Stage 1 – Desired Results		

UNIT SUMMARY	**CORE AND SUPPLEMENTAL MATERIALS/RESOURCES (OPEN RESOURCES)**
Brief 2-4 sentence description of unit purpose, what is covered, and what students will understand at the conclusion of the unit. **What is VR Design.** **What software is needed for VR Design.** **How much does VR Software cost.** **How much time does it take to learn VR programming.**	**Small Unit of Study for Virtual Reality (VR) (Independent)** **Programs - Mozilla-A-Frame, Unity VR** **Internet Resources** **https://aframe.io** **https://unity.com** **Hardware:** **Oculus Rift** **HTC Vive** **Valve Index**
UNDERSTANDINGS	
Students will understand that… **ABle to design a simple VR program using available software.**	
Students will know…	**Students will be able to…**
What content will be covered that students must master? **Able to set up VR equipment for VR programs.** **Able to create a simple VR Program.** **Able to work on VR software via a tutorial system.**	*What should students be able to accomplish to demonstrate understanding?* **Create a simple VR program.** **Run VR program on VR equipment.** **Explain the design process of VR Design with available software.**
Stage 2 – Assessment Evidence	
Performance Tasks: *What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?* *How will students demonstrate their understanding (meaning-making and transfer) through complex performance?* **Laboratory Projects** **Lecture / Notes** **Current Events** **Quizzes / Tests** **Lab Reports** **Skill Presentations** **Group / Team Projects** **On-line Google Instructions / Demonstrations** **On-line Google Video Tutorials**	Other Evidence **(Alternate Assessments)**: *What other means of assessment will be used throughout this unit?* **Benchmark Exam** **Homework / Classroom Assignments** **Lab Projects / Class activities** **On-line Google Activities / Forms** **Formative / Summative Assessments**
Stage 3 – Learning Plan	

• Where is the work headed? Why is it headed there? What are the student's final performance obligations, the anchoring performance assessments? What are the criteria by which student work will be judged for understanding? (These are questions asked by students. Help the student see the answers to these questions upfront.)

• Hook the student through engaging and provocative entry points: thought-provoking and focusing experiences, issues, oddities, problems, and challenges that point toward essential questions, core ideas, and final performance tasks.

• Explore and Equip. 21st Century Learning and Interdisciplinary connections. Engage students in learning experiences that allow them to explore the big ideas and essential questions; that cause them to pursue leads or hunches, research and test ideas, try things out. Equip students for the final performances through guided instruction and coaching on needed skill and knowledge. Have them experience the ideas to make them real.

•Organize and sequence the learning for maximal engagement and effectiveness, given the desired results.

What pre-assessments will you use to check student's prior knowledge, skill levels, and potential misconceptions?
Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?
Does the learning plan reflect principles of learning and best practices?
Is there tight alignment with Stages 1 and 2?
Is the plan likely to be engaging and effective for all students?

PROGRESS MONITORING
How will you monitor students' progress toward acquisition, meaning-making, and transfer, during lesson events?
What are potential rough spots and student misunderstandings?
How will students get the feedback they need?
What supports are needed for students to be successful? Re-teach, small group instruction, etc.

LEARNING PLAN – Activities

Design a simple VR program with available software.

Set up various VR equipment to host VR Computers.

Run VR programs on host VR computers.

Breakdown VR equipment and properly store equipment.

Planned Differentiation & Interventions for Tiers I, II, III, ELL, 504s, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.

•Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.
Gifted & Talented: Designed for students that can go beyond the scope of the lesson, may develop an individual project(s) to further enhance their individual skill. These projects could include computer software/hardware trouble shooting, advanced systems preparations for new project lessons. GT students are tiered leaders and can be paired with students in tiers 2 and 3.
Tier I: Provide students with opportunity to research/develop the lesson, and enhance their overall skill of the lesson. These on line sources could include video instruction of the specific project lesson.
Tier II: Students that may need lesson reinforcement may be paired with tiered leaders that have demonstrated lesson mastery, and or provide students with alternate methods of learning via online data pertaining to the lesson. In some cases, a more detailed guided instruction may be needed to be given to the student.
Tier III: Provide students with additional time, one on one instruction, paired with tiered leaders, and or alternate methods/completion of project learning, classroom assignments and exams.
ELL: Students have access to Google translate. Students may have assignments and assessments printed in their native language if available. Students will be partnered with other students that speak their language if possible. Students may take quiz/exams with ELL teacher.
504s: Accommodating based on recommendations. Ability for notes and lessons to be unplugged, select grouping. Etc... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.
SPED: Accommodations will be provided according to IEP. Examples: preferential seating, extra time to complete assignments and quiz, read quiz aloud, copy of notes... Additionally, SPED students will be grouped into appropriate tiers and receive those additional accommodations.